

O.S. 7

Treatment of old
Dislocations of Shoulder-
Joint -

EXTRACTED FROM THE

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ON THE
TREATMENT OF OLD DISLOCATIONS OF THE
SHOULDER BY SUBCUTANEOUS SECTION
OF THE HUMERUS AND THE FOR-
MATION OF A FALSE JOINT.

WITH THE REPORT OF A CASE IN WHICH THIS OPERATION WAS
PERFORMED.

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IN the month of August, 1875, J. R., æt. 38, a resident of Trenton, N. J., consulted me for the relief of great pain and immobility of the right shoulder-joint. The following history was given at the time: In the latter part of June, 1874, the patient fell through a trap-door, striking the right shoulder on the steps as his body descended. Immediately after the receipt of the injury, the parts were examined by a physician, who placed the arm in a sling, and ordered sorbefacient lotions to be applied. Under this treatment the contusion and swelling disappeared in a short time, leaving the joint painful and restricted in its movements; there was also observed an inability to approximate the arm closely to the side of the trunk. At the expiration of a month the arm was removed from the sling, and all treatment was discontinued; the pain and

impairment of motion in the joint continued to increase; the former was of a dull, aching character, most distinctly felt just beneath the coracoid process of the scapula, and extending about half way down the arm, and was very marked at the close of the day's work. At night the patient experienced relief by removing the arm as far as possible from his body—as nearly to a right angle as he could bring it. Becoming anxious with regard to the condition of his arm, and desiring relief from the pain he suffered, he came to the city in quest of further advice.

An examination of the joint was carefully made, the clothing having been removed, and all of the signs of a luxation were found to be present. The arm was markedly projected from the side of the body, and extended, the elbow drawn backward, and the forearm in a state midway between supination and pronation. The shoulder was prominent, and the depression beneath the acromion process was quite conspicuous. The patient was unable to place the hand on the opposite shoulder while the arm was approximated to the side of the body. The head of the humerus could be felt beneath the coracoid process of the scapula, fixed in its abnormal position. As imparted to the hand, the temperature of the arm was lower than that of the other arm; as compared with the pulsation of the vessels at the wrist of the left arm, the beat was notably lessened in fulness and force in the vessels of the disabled arm. In the forearm, the muscles appeared to be normal as to texture and firmness, whilst those of the arm were soft and flabby, and in the deltoid muscle there were evidences of atrophic changes. Slight numbness

was experienced in the inside of the arm, forearm, and little fingers, corresponding to the parts supplied by the ulnar nerve.

The clothing of the patient having been put on, the movements of the arm were observed. With great effort, and by drawing back the shoulder, the patient could introduce the hand into the pocket of the pantaloons; the hip pocket could not be reached; the watch could not be taken from the vest pocket on the left side; all of the manipulations necessary in putting on and removing articles of dress, were performed with the sound arm. The patient was unable to button his shirt-collar, or use a hair-brush with the affected arm.

With a view to extend the examination, and to ascertain the possibility of effecting reduction, I suggested the administration of ether on the day following. To this proposition the patient assented, and the anæsthetic agent was given by Dr. C. E. Black, U. S. Navy. Before he was placed under its influence, I distinctly stated to the patient that my object was to confirm the diagnosis which had been made, and to determine whether it was advisable to make any efforts at reduction, rather than to attempt by forcible manipulations to restore the head of the bone to its normal position. I put before him the danger of violent efforts at replacement in old luxations, and informed him that he must not be disappointed if I should make no extended efforts at reduction. When completely anæsthetized, a careful examination was made, and the diagnosis was confirmed. The head of the humerus was found to be fixed in its acquired position by adhesions, which

existed to such an extent as to make any efforts at reduction inadvisable. Very little more, if any, movement was attainable under the influence of the anæsthetic agent than was accomplished by the unaided efforts of the patient himself, thus showing that he had in his daily work developed the use of the crippled arm to its fullest extent. When he had recovered from the effects of the ether, I informed him that the parts had been found in such a condition as to render efforts at reduction hazardous, and that he must endeavor to content himself with the arm in its present, impaired state. He was advised to maintain as much motion in the arm as possible, and to apply anodyne lotions to control the pain.

In December of the same year, the patient again presented himself, and stated that the pain had increased, and that the movements of the arm had become more restricted. He earnestly desired that something should be done to afford him relief from the wearing pain, and at the same time, if possible, to restore his arm to its former usefulness. I refused to make efforts at reduction, for the reasons before given, and suggested excision of the head of the humerus. The latter procedure, he was informed, would, in all probability, accomplish the removal of the pain, but it was questionable whether he would derive any benefit from the operation as far as the use of the arm was concerned. Moreover, the operation itself involved danger, and it was to be considered whether his condition justified the adoption of a plan of treatment so formidable in character. The patient returned to his home, but in the latter part of September, 1876, again presented himself,

stating that he desired to have excision of the head of the bone performed. He felt that he could no longer endure the pain to which he was subjected, and was prepared to assume all responsibility as to the dangers of the operation. He was placed upon preparatory treatment, and instructed to return in two weeks, when the operation would be done.

In studying, in the mean time, the conditions which were present in the dislocation, and the causes concerned in the production of the pain, it occurred to me that an operation of less gravity than excision of the head of the humerus would accomplish all that was necessary. The indications were clearly to remove the pressure exerted by the head of the bone upon the vasculo-nervous cord of the axilla, portions of which had been caught between the head of the bone and the coracoid process, and were held in this position by subsequent inflammatory adhesions. Every movement of the humerus caused pain, owing to the impact of the head. It seemed to me, therefore, that relief could be afforded by destroying the continuity of the bone, so that the head would remain quiescent whilst the shaft and lower extremity could respond to the action of the muscles attached to that portion. Not only was it necessary to place the head of the bone in a state of quiescence, but it was equally, if not more, desirable to remove the constant tension produced by the contraction of the muscles acting upon the humerus. The coraco-brachialis and short head of the biceps muscles held the bone against the coracoid process, the force of contraction being exerted in the line of the long axis of the bone, whilst the muscles inserted into the bicipital groove,

assisted by drawing the shaft toward the body. I decided, therefore, to divide the bone above the insertion of these muscles, and to separate the fragments, thus destroying the continuity of the bone, so that pressure could not be exerted.

In order to accomplish section of the bone in the most exact manner and with the least risk, I determined to employ the plan of subcutaneous division, as practised by Mr. Adams, the distinguished surgeon of London, on the femur, in cases of ankylosis of the hip-joint. I was confirmed in my opinion as to the application of the operation in this case, after witnessing subcutaneous section of the femur for the relief of ankylosis, by Dr. John Ashhurst, Jr. At my request, Dr. Ashhurst saw Mr. R. with me in consultation, and agreed in regard to the employment of this method of treatment. The instruments used in effecting division of the bone were those devised by Mr. Adams, and consisted of a tenotome (Fig. 1), and a saw (Fig. 2), both with long shafts,

FIG. 1.



FIG. 2.



the cutting edge of the saw being not more than an inch and a half in extent, or equal in length to the diameter of the humerus.

The operation was performed October 16, 1876, there being present Drs. John Ashhurst, Jr., Packard, Keen, Willson, and Mr. Harrison, medical student. The patient having been placed under the influence of ether by Dr. Willson, the knife was carried flatwise through the tissues, on the outer aspect of the arm, two inches below the acromion process, directly to the bone. When the point came in contact with the bone, the position of the blade was changed, and the periosteum divided by incisions very carefully made, the edge of the knife being kept closely in contact with the bone. The knife having been withdrawn in the same manner as that in which it was introduced, the saw was passed flatwise through the opening, to the bone. The cutting edge having been placed on the bone, it was divided by very short "higgling" movements, the time required to sever it being five minutes. When section was completed, the fragments were separated, the lower one being thrown backwards and outwards, and the arm was placed in the Velpeau position and secured by bandages. Not more than a drachm of blood was lost. The wound closed in three days without supuration. At the expiration of ten days the arm was released, and passive motion was instituted. Shortly afterwards the patient was permitted to return home, with instructions to exercise the arm daily in the various movements of abduction, adduction, rotation, elevation, flexion, etc. Immediately following the operation, the pain ceased, and he has had no return of it.

In dividing the bone I endeavored to apply the saw at the middle of the surgical neck, above the

insertion of the teres major muscle. At this point there is less danger of wounding the bloodvessels, which, above, supply the structures about the joint, and below, the humeral muscles. The anterior and posterior circumflex arteries, from the third part of the axillary, are usually above this point, and the superior profunda, from the brachial, reaches the bone at the lower border of the teres major, and then passes to its spiral groove. Application of the saw to the bone on its outer aspect, and the very restricted movements made, prevented injury to the long tendon of the biceps muscle.

Three months after the operation, the patient was present at a meeting of the College, and was examined by the Fellows in attendance. At that time the following conditions were noted: The arm hung naturally by the side; there was no apparent difference in the length of the two limbs; when stripped and examined, it was found to be natural in size and contour; the muscles were firm, and the atrophy of the deltoid had, in a great measure, disappeared. The temperature was normal; the pulse had acquired fulness, and corresponded in character with that of the opposite arm. A small red spot, two inches below the acromion process, indicated the point at which the knife had been entered. Rotation of the arm could be performed without causing pain and without moving the upper fragment. When the lower fragment was forced up and rotated, slight crepitus could be elicited. The hand could be placed on the opposite shoulder, into the pantaloons pocket, and into the hip-pocket, with ease; the watch could be taken readily from the vest-pocket; the patient used

his hand without restriction in putting on and removing his clothing, and in all of the manipulations incident to his calling as a druggist. He stated that he could raise a sixteen-pound weight by the pulley, and practised at this exercise daily, increasing gradually the weight. His general health was excellent; the depressed mental condition from which he had suffered, prior to the operation, had disappeared; and he was cheerful, and much encouraged at the prospect of being permanently relieved from pain and of having a useful arm.

A careful examination made some months later, showed that the false joint which had been formed, was in every respect satisfactory. At the time of the separation of the fragments, without doubt the periosteum was not entirely divided, but was sufficiently stripped off by the force employed, to completely prevent contact, and yet give a character of firmness to the joint, which was desirable. Moreover, the position in which the arm was placed kept the fragments at an obtuse angle, and thus assisted in the prevention of union. The movements are so free in every direction that it is quite evident that the greater portion of the circumference of the upper end of the lower fragment is free from periosteal attachments, or adventitious bands. Faithful attention to exercise of the joint, for a period covering now nine months, has placed it in such a condition that I believe no fear can be entertained as to any impairment in its functions, much less as to a total loss of movement.

In a communication which I have had the pleasure to receive from Mr. Adams, he calls attention to the fact that after section of the femur, where the opera-

tion is performed for the relief of ankylosis, "Motion is apt to be lost if passive motion is not steadily persevered in." I am inclined to believe that loss of movement would be more likely to occur in a false joint formed in the femur than in the humerus, owing to the difference in the functions of the two extremities, and to the difficulty experienced in inducing the patient to maintain steadily passive motion in the lower limb. The superincumbent weight of the body, with the contractile force of the more powerful muscular structures and a comparatively limited range of movements, would prevent the formation of a joint as freely movable as could be obtained in the bone of the upper extremity.

The results in this case have been so successful, with regard to each of the conditions to be relieved, that I have felt at liberty to report it at length, and to call attention to the subject to which it relates, which is of the highest importance, and should claim at our hands the most careful consideration.

Prof. Gross, in his *System of Surgery*, employs the following expressive language with regard to it:—"The subject of old, chronic, or neglected luxations, has not received the attention which its importance merits. It is to be feared that their treatment is seldom guided by sound scientific principles. They constitute a class of cases which almost every surgeon approaches with doubts and misgivings, being anxious to do something for the patient's relief, and yet afraid lest that something shall produce serious, if not irreparable mischief." These feelings he himself has shared, and he further declares the dangers which attend the usual methods of treatment to be

such as to cause the surgeon "to hesitate before he enters upon an enterprise so fraught with unpleasant consequences." Under the head of Chronic Dislocations of the Shoulder-joint, he calls attention to the fact of their being frequently brought under the notice of the surgeon, and of the necessity of using great caution in undertaking efforts at reduction. Whilst the records of surgery contain numerous instances of reduction in cases of long standing, they present on the other hand a long list of disasters which have followed such attempts. It is fair to assume that this list is not complete, owing to the lack of courage on the part of many operators to report accidents of such a grave nature. On examination it is found that the reported cases have occurred in the hands of some of the most eminent men in the profession, men whose standing could well endure the shock of such misadventures; what is the record among the mass of practitioners under whose treatment most of the cases may have passed?

The nature of the injury inflicted by efforts at reduction has varied. In the greater number of cases, rupture of the artery or vein, or both, has occurred; in some, the nerves have been lacerated; in others, fracture of the bone has resulted, with more or less injury to the surrounding structures. In the notable case reported by Guérin, the entire forearm was torn from the body in the efforts to reduce a luxation of only three months' standing. In many cases in which the attempts have been successful in restoring the head of the bone to its normal position, the force employed has been so severe as to permanently impair the usefulness of the joint.

Returning to the consideration of those cases of long standing in which reduction has been successfully accomplished, I think we are justified in subjecting them to critical examination before accepting the results. It is important, first, to have determined the exact nature of the dislocation; Was it complete in character, by which I mean, did there exist a rupture of the ligaments to such an extent as to permit the escape of the head of the bone from its enveloping ligament, and its permanent lodgment in an abnormal position? Second, what was the condition of the joint after restoration of the bone to its place? The case reported by Dr. Nathan Smith, in which reduction was effected after luxation had existed for one year, is quoted as a remarkable instance in all text-books on surgery. Desiring further information with regard to this case, I addressed a communication to Dr. Smith's son, the late venerable Dr. N. R. Smith, the distinguished surgeon of Baltimore, and was informed by him in reply that, as far as he remembered, the case occurred in the person of a woman of delicate constitution, and in whom the muscular tissues were much relaxed. Within a few months past, I was asked by my friend Prof. Tyson, to examine a chronic luxation of the shoulder-joint of over two years' duration, in a woman upwards of sixty years of age. In this case, I found the tissues so relaxed that it was possible not only easily to reduce the dislocation, but to produce one at will. If the cases of chronic character, reported in the treatises on surgery as instances of successful reduction, partook of the nature of these above alluded to, then

they must be received with caution, "especially when viewed as examples for our imitation."

With regard to the condition of the articulating surfaces of the bones entering into the formation of the joint, I cannot conceive it possible that they should remain in a state so normal as respects function, as to admit of the readjustment of the parts, and a return to usefulness, after so long a lapse of time. How much in accord with this fact is the work which nature herself accomplishes in these very cases, as observed in the cavities formed for the reception and lodgment of the displaced bone in the various parts of the body adjacent to the articulation? By her laws, a part of the body not performing its accustomed function, is not maintained; as witness the atrophy occurring in the muscular structures in palsied extremities, or the molecular destruction of detached and dead osseous tissue. Does it not so follow with the unused joint? Does not the function of synovial membrane cease, and the membrane itself disappear; the ligaments become rigid; the muscles atrophied? Is it, therefore, under any circumstances, a rational plan of treatment to restore the displaced bone to a cavity the character of which must have become completely changed?

In order to facilitate reduction in chronic luxations, Diffenbach suggested, and, it is stated, performed with success, subcutaneous division of the muscles, ligaments, and tendons surrounding the joint; the case was one of two years' standing. This operation I have witnessed once, and it was followed by a fatal result. Certainly it is a procedure which cannot be commended; and it is interesting to contemplate the

condition and capacity for use of an articulation which has been submitted to such general mutilation of its component parts. As another method of treatment, and one more rational, excision of the head of humerus has been performed with success. Two such operations have been done in this country, and in each case the operation was called for to afford relief from constant pain produced by pressure. The operation, it is to be remembered, involves much danger, the state of the parts differing materially from that encountered where excision is called for in cases of wound of the articulation.

Such, therefore, being the record under the plans of treatment usually suggested and executed in cases of chronic luxation of the shoulder-joint, I feel that subcutaneous section of the bone can be offered as a method which, in its simplicity, freedom from hazard, and successful result, as exemplified in the case reported, commends itself. When operative interference is demanded for the relief of pain consequent upon pressure, subcutaneous section accomplishes the result by destroying the continuity of the bone. In cases where the impairment of the functions of the arm is so great as to justify efforts to secure improvement, section of the bone gives relief in the formation of a new articulation, the use of which approaches in character that of the normal joint.

Further experience will test the claims of the operation, and develop its defects, if they should exist.¹

¹ It should have been stated that Prof. Agnew also saw this patient in December, 1875, and confirmed the diagnosis, and agreed in advising that no effort at reduction should be made.